

The Methodological Challenge of the Functional Analysis of Verbal Behavior

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Where is the "science of verbal behavior" that was mentioned a number of times in Skinner's (e.g., 1957, p. 431) writings as a future development in behavior-analytic science? Progress has clearly been made in the analysis of verbal behavior, if slowly, in the 40 years since the publication of Skinner's *Verbal Behavior*, and the field of verbal behavior is an established and growing part of the scientific culture of behavior analysis. However, few behavior analysts appear to be entering the verbal field as an area of specialization, and the proportion of behavior-analytic research devoted to verbal behavior remains small.

There are undoubtedly numerous factors that might account for a relative lack of growth in the verbal field; for example, (a) the strategic character of behavior analysis in moving carefully from the simple to the complex as power of the analysis allows; (b) the complexity of *Verbal Behavior* (1957) as a systematic interpretive exercise in the context of an empirically based scientific field; (c) various professional issues, including the increasing practical emphasis upon certain areas of applied research, along with a relative scarcity of basic-research jobs, decreasing research funding, and so on. I suggest that in addition to such factors, however, the field of verbal behavior has also presented a particularly difficult methodological challenge to the field of behavior analysis.

In the early years of the experimental analysis of behavior, the distinguishing methodological characteristics may be de-

scribed in the following way: There was an emphasis upon the intact, freely moving individual organism in a controlled experimental setting, in which behavior was recorded directly in real time, and where records of such behavior in conjunction with manipulated events in the experimental space were available for the discrimination of controlling relations, and so on. Originally many of the experiments examined moment-to-moment dynamics of such interactions, although in later years the emphasis shifted to experiments employing steady-state behavior and well-established baselines (e.g., Galbicka, 1997). Part of the challenge of verbal behavior is that the exceedingly sensitive and dynamic character of verbal interactions (e.g., Skinner, 1957) probably renders the dominant behavior-analytic tradition of steady-state research methods relatively ineffective. In those areas of verbal interactions where steady states and the collection of well-established baselines may be appropriate, the concept of a baseline may be in need of reexamination (e.g., Day, 1992; Leigland, 1996a; Place, 1991, 1997).

The range of challenges might be illustrated by summarizing some of the areas of verbal behavior research in which further methodological innovation and extension would be most useful (although the following list is certainly not exhaustive). First, the most active single area of research of relevance to verbal interactions as a "symbolic" functional activity is the field of stimulus equivalence or derived relational phenomena (e.g., Hayes, 1994; Sidman, 1994). Two methodological challenges present themselves in that (a) the need to extend the

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experimental preparations beyond the standard arbitrary matching-to-sample procedures is now widely recognized, and (b) methods are needed to clarify the relations between derived relational phenomena and the larger domain of verbal behavior as it occurs outside the laboratory, that is, an extension that is empirical rather than merely theoretical (e.g., Leigland, 1997). Second, further methodological development is needed in the functional analysis of real-time verbal interactions (e.g., Leigland, 1989b, 1996a; Place, 1991, 1997; Rosenfarb, 1992; Skinner, 1957). Third, the temporal extensiveness of verbal influence presents a variety of problems that may require new empirical, if not experimental, methods, as seen in Moerk's (e.g., 1992) detailed and revealing reanalysis of Brown's (1973) data on language development. Fourth, experimental and other empirical methods are needed in the analysis of extant verbal contingencies and practices, as in the functional analysis of verbal practices relevant to such traditionally important cultural themes as "mind" and the "mental," the class of terms historically associated with "metaphysics," and so on (e.g., Leigland, 1989a, 1996b; Skinner, 1945).

Many additional lines of research present themselves, of course, and progress is continuing in the areas listed above and in a number of other areas; for example, both basic and applied research in verbal behavior in the area of developmental disabilities have experienced rapid and productive growth (e.g., Shafer, 1994-1995). Promising methodological variations also continue to appear in a variety of areas relevant to verbal behavior (e.g., Robbins, Layng, & Karp, 1994-1995; Sundberg, Michael, Partington, & Sundberg, 1996). The building of an effective science of verbal behavior, however, will require an advance not yet achieved in behavior-analytic science; that is, the empirical exploration of verbal behavior through the development of experimental preparations as powerful functional analytic tools.

From Galileo's inclined planes and pendula to contemporary particle accelerators; from Mendel's pea plants to contemporary preparations involving *Drosophila* and tissue cultures; from Helmholtz's many

contributions and Sherrington's investigation of the reflex to Pavlov, Thorndike, and Skinner, scientific advances have been most clear and most enduring when research has moved from the conduct of individual studies to the development of whole *strategies* of analysis in which a variety of themes may be explored in a relatively organized fashion. Such preparations, as systematic empirical strategies, involve special laboratory contexts and conventions that permit experimental control and the systematic manipulation of variables that have been shown to be important. In the case of behavior analysis, the variables have been important in the analysis of behavioral contingencies. The origins of the experimental analysis of behavior can be found in Skinner's early development of the rat-lever-chamber preparation for the study of operant behavior (e.g., Skinner, 1956), and more recently, arbitrary matching-to-sample procedures have become the standard preparation by which equivalence relations have been studied in the human laboratory (e.g., Sidman, 1994).

Although there are undoubtedly many complex problems to be faced in the development of effective preparations for the functional analysis of verbal behavior, some encouragement might be found in Skinner's comments that "verbal behavior has many favorable characteristics as an object of study" (Skinner, 1957, p. 5); for example, it is easily observed, readily confirmed, and more conveniently and inexpensively recorded than any other type of behavioral event. It is indeed possible that progress may be made with relatively simple experimental arrangements (cf. Leigland, 1989b, 1996a; Sundberg et al., 1996). In any case, it is probably not an overstatement to say that the future of behavior-analytic science depends upon the functional analysis of verbal behavior, and that future of Skinner's "science of verbal behavior" depends, in turn, upon how behavior analysts rise to meet the methodological challenge.

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